NON-PUBLIC?: N
ACCESSION #: 8908220405
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Braidwood 1 PAGE: 1 of 4

DOCKET NUMBER: 05000456

TITLE: Unit 1 and Unit 2 Reactor Trip As a Result of Lightning Induced Voltage Transients Affecting the Rod Control System
EVENT DATE: 07/18/89 LER #: 89-006-00 REPORT DATE: 08/14/89

OPERATING MODE: 1 POWER LEVEL: 086

OTHER FACILITIES INVOLVED: Braidwood 2 DOCKET NO.: 05000457

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: C. Wiengand, Technical Staff Engineer TELEPHONE: (815) 458-2801

COMPONENT FAILURE DESCRIPTION:
CAUSE: SYSTEM: COMPONENT: MANUFACTURER:
REPORTABLE NPRDS:

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT:

At 2020 and 2026 on July 18, 1989 the Station experienced Lightning induced voltage transients causing multiple rod drive overvoltage protection devices to actuate on Unit 1 and 2, respectively. On Unit 1 ten out of ten overvoltage protectors actuated. On Unit 2 seven out of ten overvoltage protectors actuated. This removed power to various rod drive control cards and allowed numerous control rods to drop. Both reactors tripped due to Negative Rate Trip on the power range. Immediate corrective actions were to stabilize the Plant, reset the overvoltage protectors, and verify Rod Control operability. The exact location of the Lightning strikes are unknown. The root cause is inadequate protection and isolation of the Rod Control System from Lightning induced transients. The immediate corrective actions were to reset the overvoltage protectors. No damage occurred to the Rod Control System. There has been one previous occurrence of a Lightning induced voltage transient resulting in a reactor trip. Corrective actions were implemented addressing both root and contributing causes for the above event.

The previous corrective actions are not applicable to this event.

END OF ABSTRACT

A. PLANT CONDITIONS PRIOR TO EVENT:

Unit: Braidwood 1; Event Date: July 18, 1989
Event time: 2020;
Mode: 1 - Power Operation; Rx Power: 86%;
RCS (AB) Temperature: Tavg 3 degrees less than Tref
RCS Pressure: 2238 psi
In coastdown

Unit: Braidwood 2; Event Date: July 18, 1989
Event Time: 2026;
Mode: 1 - Power Operation; Rx Power: 84%;
RCS (AB) Temperature/Pressure: NOT/NOP
Ramping from 99% to 66% power in progress.

B. Description of Event:

There were no systems or components inoperable at the beginning of the event which contributed to the severity of the event.

At 1653 on July 18, 1989 the Commonwealth Edison Load Dispatcher notified the Braidwood Station Shift Engineer that thunderstorms, high winds, and lightning would be in the area until 0400. Lightning was in the area at the time of the event and spurious source range spiking was occurring.

At 2020 and 2026, the Station experienced Lightning induced voltage transients causing multiple rod drive overvoltage protection devices to actuate on Unit 1 and 2, respectively. On Unit 1 ten out of ten overvoltage protectors actuated. This removed power to various rod drive control cards and allowed numerous control rods to drop. Both reactors tripped due to Negative Rate Trip on the power range.

There were no manual or automatic safety system actuations required. Licensed operators performed a safe shutdown in accordance with approved Station procedures. Operator actions neither increased or decreased the severity of this event.

Immediate corrective actions were to stabilize the plant, reset the overvoltage protectors, and verify Rod Control operability.

Stable plant conditions were established at 2025 for Unit 1 and 2030 for Unit 2.

The appropriate NRC notification via the ENS phone system was made at 2310 pursuant to 10CFR50.72(b)(2)(ii).

At 1410 CST on July 19, 1989, a discussion was held between Braidwood Station and the NRC resident Inspectors. As a result of that discussion, it was decided that it would be appropriate to report the dual unit trip in this report.

This event is being reported pursuant to 10CFR50.73(a)(2)(iv) - any event or condition that resulted in manual or automatic actuation of any Engineered Safety Feature, including the Reactor Protection System.

C. CAUSE OF EVENT:

Both Unit 1 and Unit 2 rod drive control power supplies tripping on overvoltage protection actuation is directly attributed to the lightning strikes. The exact location of the lightning strikes are unknown. The activation of the overvoltage protection devices effectively shut off the power supplies to the controlling circuits of the Rod Control Power supply cabinets. There are two +24 vdc power supplies in each cabinet. One acts as the primary power supply and the other acts as a backup. Since both power supply overvoltage protection devices actuated, the rods were released causing a negative rate of sufficient magnitude to result in the reactor trips.

The root cause is inadequate protection and isolation of the Rod control System from lightning induced transients.

This event did not involve any personnel or procedure errors.

D. Safety Analysis:

This event had no effect on the safety of the plant or the public. All systems operated as designed. The plant automatically tripped upon the occurrence of this event and safe shutdown was accomplished following approved Station procedures.

Under worst case conditions of the Units operating at 100% power, the response would have been the same.

E. Corrective Actions

The immediate corrective actions were to reset the overvoltage protectors and verify that Rod Control was operable. No damage occurred to the Rod Control System.

Commonwealth Edison Engineering, Sargent & Lundy, and Westinghouse are conducting a review of the station lightning protection system for the rod drive control system. The resolution of this review will be tracked to completion by action items 456-200-89-10401.

F. Previous Occurrences:

There has been one previous occurrence of a lightning induced voltage transient resulting in a reactor trip.

DVR/LER Number Title

20-1-88-240/88-023 Instrument Failures on Unit 1 and Reactor Trip Docket 456 on Unit 2 From Lightning Induced Voltage Transients

Corrective actions were implemented addressing both root and contributing causes for the above event. The previous corrective actions are not applicable to this event.

G. Component Failure Data:

This event was not the result of component failure, nor did any components fail as a result of this event.

Commonwealth Edison
Braidwood Nuclear Power Station
Route #1, Box 84
Braceville, Illinois 60407
Telephone 815/458-2801

August 16, 1989
BW/89-948

U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Dear Sir:

The enclosed Licensee Event Report from Braidwood Generating Station is being transmitted to you in accordance with the requirements of 10CFR50.73(a)(2)(iv) which requires a 30 day written report.

This report is number 89-006-00; Docket No. 50-456.

Very truly yours,

R. E. Querio
Station Manager
Braidwood Nuclear Station

REQ/AJS/jab
(7126z)

Enclosure: Licensee Event Report No. 89-006-00

cc: NRC Region III Administrator
NRC Resident Inspector
INPO Record Center
CECo Distribution List

*** END OF DOCUMENT ***